

## CLAIMS:

1. An actuator connectable to and for adjusting a device, wherein the actuator comprises:
  - 5 a housing having a longitudinal passage extending between a first end and a second end of the housing and defining an opening at or adjacent to the second end;
  - 10 a spindle supported in the housing and movable longitudinally in the housing passage, the spindle having two oppositely handed, longitudinally spaced threaded portions of which a first threaded portion is nearer to the first end and a second threaded portion is nearer to the second end;
  - 15 a first threaded nut fixed relative to the housing and threadedly engaged with the first threaded portion of the spindle;
  - 20 a handle rotatably mounted at the first end of the housing, the handle being coupled to the spindle for rotating the spindle in the first nut and thereby moving the spindle longitudinally relative to the first nut and the housing;
  - 25 a second nut fixed against rotation relative to the housing and threadedly engaged with the second threaded portion of the spindle, whereby in response to rotation of the spindle by the handle the second nut is movable longitudinally in the housing passage relative to the spindle, in the same direction as movement of the spindle relative to the housing; and
  - 30 connecting means on or of the second nut and connectable, through the opening defined by the housing, to an adjustable device to be adjusted by the actuator;
  - 25 wherein the spindle is rotatable by the handle for adjusting the adjustable device by longitudinal movement in the same direction of the spindle relative to the housing and of the second nut relative to the spindle.
2. An actuator connectable to and for adjusting a device, wherein the actuator comprises:
  - 30 a housing having a longitudinal passage extending between a first end and a second end of the housing and defining an opening at or adjacent to the second end;

a spindle supported in the housing and movable longitudinally in the housing passage, the spindle having two oppositely handed, longitudinally spaced threaded portions of which a first threaded portion is nearer to the first end and a second threaded portion is nearer to the second end;

5 a first threaded nut fixed relative to the housing and threadedly engaged with the first threaded portion of the spindle;

a handle rotatably mounted at the first end of the housing, the handle being coupled to the spindle for rotating the spindle in the first nut and thereby moving the spindle longitudinally relative to the first nut and the housing;

10 a second nut fixed against rotation relative to the housing and threadedly engaged with the second threaded portion of the spindle, whereby in response to rotation of the spindle by the handle the second nut is movable longitudinally in the housing passage relative to the spindle, in the same direction as movement of the spindle relative to the housing; and

15 connecting means on or of the second nut and connectable, through the opening defined by the housing, to an adjustable device to be adjusted by the actuator;

wherein the spindle is rotatable by the handle for adjusting the adjustable device by longitudinal movement in the same direction of the spindle relative to the housing and of the second nut relative to the spindle;

20 wherein the actuator further comprises:

an opening formed in the second nut and configured for receiving and securing an end of a cable of a Bowden cable system and thereby comprising the connecting means; and

25 the housing at the second end having an engagement member for fixing a sleeve of the Bowden cable system;

wherein the spindle is operable for moving the cable longitudinally through the sleeve for adjusting the adjustable device to which the other end of the Bowden cable system is connected.

30 3. An actuator connectable to and for adjusting a device, wherein the actuator comprises:

a housing having a longitudinal passage extending between a first end and a second end of the housing and defining an opening at or adjacent to the second end;

5 a spindle supported in the housing and movable longitudinally in the housing passage, the spindle having two oppositely handed, longitudinally spaced threaded portions of which a first threaded portion is nearer to the first end and a second threaded portion is nearer to the second end;

10 a first threaded nut fixed relative to the housing and threadedly engaged with the first threaded portion of the spindle;

15 10 a handle rotatably mounted at the first end of the housing, the handle being coupled to the spindle for rotating the spindle in the first nut and thereby moving the spindle longitudinally relative to the first nut and the housing;

15 15 a second nut fixed against rotation relative to the housing and threadedly engaged with the second threaded portion of the spindle, whereby in response to rotation of the spindle by the handle the second nut is movable longitudinally in the housing passage relative to the spindle, in the same direction as movement of the spindle relative to the housing; and

20 connecting means on or of the second nut and connectable, through the opening defined by the housing, to an adjustable device to be adjusted by the actuator;

25 wherein the spindle is rotatable by the handle for adjusting the adjustable device by longitudinal movement in the same direction of the spindle relative to the housing and of the second nut relative to the spindle; and

30 25 the actuator is connectable to an adjustable device by a direct coupling between the second nut and the adjustable device, by a projection which extends laterally of the second nut, through the opening defined by the housing, with that opening being in the form of an elongate slot extending longitudinally along the housing at the second end.

30 4. The actuator of claim 3, wherein the coupling is provided by a respective said projection projecting through a respective said elongate slot at each of opposed sides of the second nut and housing.

5. The actuator of claim 3, wherein the projection extends from the second nut and comprises the connecting means.
6. The actuator of claim 3, wherein the projection extends from the adjustable device and the connecting means comprises a lateral bore defined by the second nut in which an end of the projection is engageable.
7. The actuator of claim 1, wherein each threaded portion has a thread of a substantially common pitch.

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8. The actuator of claim 1, wherein the handle is mounted on the housing and held thereon against longitudinal movement relative to the housing, and wherein the coupling between the handle and the spindle enables the spindle to adjust longitudinally relative to the handle as the spindle moves longitudinally with respect to the housing.
9. The actuator of claim 8, wherein an end portion of the spindle at the first end of the housing is movable longitudinally within a sleeve defined by the handle, and wherein there is a key and keyway or splined coupling between the sleeve of the handle and the spindle.

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10. The actuator of claim 1, wherein the first nut is held against rotation by a key and keyway engagement with the housing.

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11. The actuator of claim 1 or claim 10, wherein the first nut is held against movement longitudinally of the housing by being located between a shoulder and at least one tab, and wherein the shoulder is defined by the housing and faces towards the first end and the at least one tab is formed integrally with the housing and protruding resiliently into the passage.

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12. The actuator of claim 1, wherein the second nut has first and second longitudinally adjacent sections, of which the first section comprises an internally threaded sleeve by which the second nut is engaged with the second threaded

portion of the spindle and the second section extends longitudinally beyond the spindle from the first section, towards the second end of the housing.

13. The actuator of claim 2, wherein the second nut has first and second  
5 longitudinally adjacent sections, of which the first section comprises an internally threaded sleeve by which the second nut is engaged with the second threaded portion of the spindle and the second section extends longitudinally beyond the spindle from the first section, towards the second end of the housing; and

10 wherein the opening comprising the connecting means is formed in and opens laterally of the second section and the second section further defines a radial slot which extends from the lateral opening towards the second end of the housing whereby, with the nipple of the cable of the Bowden system received in the lateral opening, the cable can be adjusted so as to extend longitudinally from the second nut.

15 14. The actuator of claim 13, wherein the housing defines a side opening communicating with the passage and a slot extending from the side opening to the second end whereby a cable adjusted so as to extend longitudinally from the second nut also is able to be adjusted to extend through the second end of the  
20 housing.

15. The actuator of claim 1, wherein the second nut is of substantially circular cross-section and has at least one radial projection which is slidable along a longitudinal slot defined by the housing along a part of the passage along which  
25 the second nut is movable relative to the spindle.

16. The actuator of claim 2, wherein the engagement member at the second end of the housing is a sub-housing adapted to receive therein a suitably shaped termination of the sleeve of the Bowden system.

30 17. The actuator of claim 16, wherein the sub-housing has a part cylindrical peripheral wall which defines a lateral opening through which at least part of the terminator is receivable, and an inwardly extending flange or bead at an edge of

the wall remote from the housing for retaining the termination from longitudinal disengagement from the actuator.

18. The actuator of claim 1, wherein the spindle has an unthreaded part of its  
5 length between adjacent ends to the threads of the first and second section, with  
said unthreaded part having abutment means for providing a sharply defined stop  
when the spindle and the second nut are moved towards the second to respective  
limiting positions.

10 19. The actuator of claim 8, wherein said abutment means is provided by a  
lateral tab projecting from the spindle, with the tab having a leading face in the  
direction of rotation of the spindle for movement towards the second end, and the  
abutment means is adapted to stop rotation of the spindle by said abutment face  
abutting a surface defined by the housing.

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